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004/002701

ART 34 AMDT

CT/NL2003/000477

10/519273

Method for providing attachments between a concrete part to a further part

The present invention relates to method for arranging a cavity in a concrete part. A method of this type is known from Belgium patent 502991. This patent describes the production of a cavity by the introduction of an elastomeric material into a formwork. This rubber elastomeric material extends through the boundary wall of the formwork. At the location where it passes through the formwork, the rubber elastomeric material forms an acute angle, so that a larger cavity is formed as a result of the formwork wall being provided with a number of auxiliary parts at that location. After the concrete has been poured, the rubber elastomeric material is removed and a stay or cable is arranged in the cavity formed in this way and tensioned by coupling parts which act on it from the outside.

It is an object of the present invention to make it easier to couple concrete parts and other parts to one another. In the prior art, concrete parts are coupled to one another by a concrete part being provided with projecting (threadable) reinforcing bars (dowels and plug-connection anchors) and the other concrete part is provided with cavities which match them. After they have been put together, the space between the concrete bars and the cavities in the concrete part are poured full of concrete. These cavities are produced by fitting pipes into the formwork before the concrete is poured. After the concrete has been poured out, these pipes remain behind in the formwork. This firstly entails considerable costs, since the pipes have to be considered lost, meaning considerable outlay. Secondly, bonding takes place between the concrete and the pipes and between the pipes and the reinforcing bar.

The object of the present invention is to provide a method of this type which enables a concrete part to be secured to the surroundings.

According to one aspect of the present invention, this object is realised in a method for securing a metal part in a concrete part, comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof, of providing a formwork, of placing a body into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the

## Claims

1. Method for securing a metal part in a concrete part, comprising the steps of providing a concrete part having a cavity which extends from an outer wall thereof,  
5 of providing a formwork,  
of placing a body into said formwork, the shape of which body at least partially corresponds to said cavity and that side of which body that adjoins the concrete material comprising an elastomer material, the mechanical properties of said body being such that, when tensile force is applied to said body in the vicinity of said  
10 boundary surface, the diameter of said body is considerably reduced, with the result that said body, after the concrete has been poured and at least partially set, can be removed from said shaped cavity, which diameter of said body can be elastically reduced,  
of pouring and at least partially setting the concrete, detaching said formwork and said  
15 body and securing said metal part in said cavity.
2. Method as claimed in claim 1, in which said body is externally provided with a profiling.
- 20 3. Method as claimed in one of the preceding claims, in which this securing step comprises the step of filling the space between the concrete part and said metal part with a material which bonds to said metal part and to said concrete part.
4. Method as claimed in one of the preceding claims, in which said securing step  
25 comprises the step of screwing said metal part into a screw thread arranged in said cavity.
5. Method as claimed in claim 4, in which said screw thread comprises an encased threaded part.  
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6. Method for arranging a series of cavities, which extend as far as an outer wall of a concrete part, in said concrete part, comprising the steps of providing a formwork, placing a series of bodies into said formwork, the exterior of each of said bodies

comprising an elastomer material.

7. Method as claimed in claim 5, in which said series of bodies are connected by a common carrier.

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8. Method as claimed in one of the preceding claims, in which said body is secured to the inner side of the formwork adjoining the latter, and after said formwork has been removed said body is also taken away.

10 9. Method as claimed in one of the preceding claims, in which said concrete part is poured in a factory remote from its final destination.

10. Method as claimed in one of the preceding claims, in which said metal part comprises reinforcing steel.

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11. Method as claimed in one of the preceding claims 1-4, in which said metal part is arranged in a further concrete part.

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12. Method as claimed in one of the preceding claims, in which said elastomer body comprises a polysiloxane material.

13. Method as claimed in one of the preceding claims, in which said body comprises a core made from a material with a higher tensile strength than its wall, is provided with a supporting surface and is self-supporting.

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14. Method as claimed in one of the preceding claims, in which said body is provided, in the vicinity of the formwork end, with securing means (99, 109) for securing it to said formwork.

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15. Method for producing a cavity in a concrete part, which cavity is elongate and, at least at one end, opens out at a boundary surface of said concrete part, comprising the steps of placing a body, the shape of which at least partially corresponds to said cavity, into a formwork, filling said formwork with concrete material and, after this concrete

material has set, removing said body, characterized in that that side of said body which adjoins the concrete material to be poured comprises an elastomer material.

- 5 16. Method as claimed in claim 13, in which said cavity opens out at both ends at the same boundary surface of said concrete part, and in which a reinforcement is provided, around which concrete material which is to be set is poured into a mould, which reinforcement is arranged in such a manner that it extends on both sides of said body, and said cavity is embodied to receive a hoisting feature.
- 10 17. Method as claimed in claim 13 or 14, in which said body is provided with series of projections which, when fitted into said formwork, extend at a distance from said end.
- 15 18. Method as claimed in claim 15, in which said projections comprise an external screw thread.
- 20 19. Method as claimed in one of claims 13-16, in which said body is provided with a receiving means for a part which is to be encased, and after the concrete body has set, said part which is to be encased remains behind in the set concrete when said body is removed.
- 25 20. Method as claimed in one of the preceding claims, in which said body comprises a core with an elastomer coating arranged around it, and in which the removal of said body from said concrete comprises firstly the removal of the core, followed by the elastomer material.
- 30 21. Concrete part which is to be coupled to a further concrete part, comprising, at the boundary surface with said further concrete part a series of cavities which extend substantially perpendicular to said boundary surface, the boundary wall of said cavities comprises concrete.
22. Assembly comprising two concrete parts secured to one another, comprising a concrete part as claimed in claim 20 and a further concrete part which is provided, at

the boundary surface with the concrete part, with a series of projecting reinforcing bars which, in the coupled state to said concrete part, extend into the cavities in said concrete part, the space between said cavity and said reinforcing bars being filled with a material which bonds said reinforcing bars to said concrete body.